

Docket No. DYOUP0219USSerial No. 09/889,800**REMARKS**

Upon entry of the present Reply, claims 1-3, 5, 7-22, 25-33 and 35-50 are pending in the present application. Claims 4, 6 and 34 have been canceled herein for the reasons noted below. New claims 47-50 have been added. Support for the new claims may be found in the claims as originally filed. No other claims have been amended.

The specification has been amended to insert headings and to correct a typographical error at page 6, line 22.

Applicants respectfully request entry of the foregoing amendments.

Applicants respectfully request reconsideration of the application based on the following.

**Objection to Claims 4 and 6**

The Examiner objected to claims 4 and 6 as being duplicates of claim 2. Applicants have accordingly canceled claims 4, 6 and 34.

**Rejection of Claims over Taylor, Chen et al. and Sampson.**

Claims 1-22 and 25-46 stand rejected as obvious over the combination of Taylor, U.S. Patent No. 5,800,837, Chen et al., U.S. Patent No. 5,341,932, and Sampson, GB 2,259,912. Applicants respectfully traverse the claim rejections for at least the following reasons.

The Examiner asserted that Taylor teaches plant fertilizer compositions comprising phosphonate and phosphate salts, described as fungicidal and as for aqueous foliar application. The Examiner asserted that Chen et al. teaches aqueous formulations comprising phosphate, salicylate and thiosulfate, and agents such as chlomequat. The Examiner asserted that Sampson teaches ammonium thiosulphate was a known plant growth stimulating agent which may be applied with other agrochemical agents such as herbicides, fungicides, insecticides or plant growth regulators. The Examiner asserted the person of ordinary skill would have been motivated to combine these references because they teach the utility of combining multiple plant nutrient materials.

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The Examiner thereupon concluded it would have been obvious to have combined Applicants' phosphonates, thiosulphates and salicylates (as used herein, "salicylate" refers generally to the disclosed and claimed salicylic acid, homologue, derivative or salt thereof) based on the teachings of the cited references. The Examiner dismissed Applicants' evidence of unexpectedly good results on the basis that such enhancement would have been expected.

Applicants respectfully traverse the rejection and submit that the Examiner has failed to state a *prima facie* case of obviousness because the asserted factual basis therefor is clearly erroneous and the rejections fail to comport with the law. Applicants further submit that, even if there was a *prima facie* case of obviousness (which there is not), the Examiner's dismissal of Applicants' extensive evidence of synergistic effect, which would unarguably rebut such case, is clearly erroneous and contrary to law.

**There is No *Prima Facie* Case of Obviousness.**

Taylor teaches the use of phosphate and phosphonate in combination only. Taylor contains neither suggestion nor any possible motivation for combining these ingredients with any other ingredient. Furthermore, Taylor teaches that the combination provides both an antifungal effect and a growth stimulation or fertilizer effect, thus detracting from any possible idea that one might need to add other ingredients.

For this reason, no person of ordinary skill would be motivated to look elsewhere for additional ingredients to add to the combination disclosed by Taylor based thereon.

Chen et al. relates to a containerization system comprising a water soluble or water dispersible bag for containing hazardous substances. Chen et al. teaches that the water soluble or water dispersible bag may contain any of dozens (perhaps hundreds) of various ingredients. The lists of ingredients which may be contained within the water soluble or water dispersible bag runs from col. 5, line 47 to col. 8, line 64, and may include other additional agents. Nestled among the many, many ingredients one can find and select, with the aid of hindsight, phosphate, salicylate and thiosulfate (col. 6, lines 9-14), *but not phosphonate*.

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Applicants respectfully submit that it is only with aid of improper hindsight that any person of ordinary skill in the art would find and select the three specific moieties, phosphate, salicylate and thiosulfate, from the extensive list in Chen et al. Applicants further submit that it is only with the improper aid of hindsight that one would *modify* these three particularly selected moieties by replacing one, phosphate, with phosphonate.

Lest the Examiner retort that Taylor teaches both phosphate and phosphonate, Applicants note that Taylor teaches that both of these are required to obtain the desired effect and that the two are not equivalent and would not be exchangeable with other materials.

With respect to claims 1, 3 and 5, there is neither suggestion nor motivation in Chen et al. to select any two of the moieties disclosed therein, even ignoring that phosphonate is not disclosed in Chen et al.

With respect to claims 1 and 3, there is no disclosure in Chen et al. of phosphonate, much less any suggestion or motivation to modify phosphate to phosphonate, if one had first selected phosphate from the many, many moieties listed by Chen et al.

Sampson discloses only that thiosulfate can be used to stimulate plant growth, and that combination of thiosulfate with acetaminophen and/or anthranilic acid provides a synergistic plant-growth effect. Sampson contains neither suggestion nor motivation to combine the thiosulfate with any other ingredient besides the acetaminophen and/or anthranilic acid disclosed therein. In fact, given Sampson's disclosure of synergy obtained from the disclosed combination, one would not be motivated to seek other additives.

Most if not all inventions arise from a combination of old elements. *See, In re Rouffet*, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998). Thus, every element of a claimed invention may often be found in the prior art. *See id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. *See id.* Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant. *See, In re Dance*, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); *In re Gordon*, 221 USPQ 1125,

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1127 (Fed. Cir. 1984). The mere fact that, with the aid of hindsight and/or a computerized search, one can find the claimed ingredients in the prior art fails to show the obviousness of selecting any particular two or three of those many disclosed ingredients as claimed in the present application.

In the present case, the Examiner's only alleged motivation for making the combination is "because they teach the utility of combining multiple plant nutrient materials". This is a wholly inadequate statement of motivation, and further shows the failure to state a *prima facie* case of obviousness..

Finally, Applicants respectfully submit that the prior art cited in the Office Action would have presented no more than an invitation to experiment, perhaps creating an "obvious to try" situation. An invention is "obvious to try" "where the prior art [gives] either no indication of which parameters [are] critical or no direction as to which of many possible choices is likely to be successful." *In re O'Farrell*, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

Because none of the cited references contains any of the legally required suggestion or motivation to make the assertedly obvious combination of the claimed compositions, and because a general desire to improve results by adding components or ingredients is insufficient, Applicants respectfully submit that the Examiner has wholly failed to state a *prima facie* case of obviousness with respect to the claimed invention of the present application. Applicants respectfully submit that, since there is no obviousness with respect to the inventions of claims 1, 3 and 5, there can be no obviousness of any of the remaining claims in the application, for at least the same reasons. Accordingly, Applicants respectfully request the Examiner to withdraw the rejection of Applicants' claims and to pass the application to allowance and issue.

#### **The Synergistic Results Overcome Any Possible Prima Facie Obviousness**

Even if, for the sake of argument only, the Examiner had stated a *prima facie* case of obviousness, Applicants' synergistic results would overcome it. The Examiner's dismissal of these results is improper legally and factually.

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Applicants disclose examples showing the unexpectedly good results, i.e., the synergism, of the claimed combinations. Examples A, from page 13 to page 18, correspond to claim 1, the combination of phosphonate with thiosulphate. Examples B, from page 19 to page 22, correspond to claim 3, the combination of phosphonate with salicylate. Examples C, from page 23 to page 26, correspond to claim 5, the combination of thiosulphate with salicylate. Examples D, on pages 27-31, correspond to claims 1, 2, 3 and 5 and show the effects of the claimed combinations on potatoes, spring barley and lettuce. Examples E, on pages 32-33, correspond to claim 5 with a plant growth regulator, as in claim 41 and new claim 50.

#### **Combination of Phosphonate and Thiosulphate - Claim 1**

Tables A1 and A2 show that a combination of phosphonate and thiosulphate (claim 1) provide to lettuce and sugar beet, respectively, a substantial and unexpected increase in resistance to powdery mildew. For example, left untreated, after 8 days lettuce has 40% powdery mildew, treated with phosphonate alone the lettuce has 8% powdery mildew, and treated with thiosulphate alone the lettuce has 10% powdery mildew. By contrast, when treated with a combination of phosphonate and thiosulphate, the lettuce has 0% powdery mildew. Similar results are obtained at 12 and 16 days, the combined phosphonate and thiosulphate continuing to show unexpectedly low powdery mildew percentages. Even if some additive effect might be expected, the reduction to zero powdery mildew after 8 days would not have been expected and shows the synergistic effect of the claimed combination.

The results with sugar beets for the combination of phosphonate and thiosulphate are even more dramatic, as shown in Table A2. Again, even if some additive effect would be expected, it would not have been expected that the powdery mildew would remain at zero after 28 or 35 days. Comparable results are shown for powdery mildew treatment with the combination of phosphonate and thiosulphate in Tables A4, A5, A7 and A8.

Tables A3, A6 A7 and A8 demonstrate that the combination of provides unexpectedly good fertilizer attributes. For example, in Table A3, the "greenness" score

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for spring barley is substantially the same when untreated or when either of phosphonate or thiosulfate are applied alone, but increases substantially when both phosphonate and thiosulfate are applied together. Similarly substantial and unexpected results are shown in Table A6, where in each case the combination of phosphonate and thiosulphate shows a substantial and unexpected increase in the above ground weight for broad bean; in Tables A7 and A8, where the combination of phosphonate and thiosulphate shows substantial and unexpected increase in root weight and above ground weight, and a substantial and unexpected decrease in powdery mildew at 24 and 28 days for sugar beet.

Even if some additive effect might be expected, the effects shown in these Tables would not have been expected and show the synergistic effect of the claimed combination.

Based on the foregoing, Applicants respectfully submit that any possible case of prima facie obviousness of claim 1 and the claims dependent thereon is fully rebutted by the unexpectedly excellent results of this claimed combination.

### **Combination of Phosphonate and Salicylate - Claim 3**

Tables B1, B2 and B4 show that a combination of phosphonate and salicylate (claim 3) provide to strawberry and spring barley, respectively, a substantial and unexpected fertilizer effect, when compared to the untreated plant and to the plants treated with only one of phosphonate or salicylate. For example, as shown in Table B1, the above ground weights for strawberry are substantially and unexpectedly increased with the combination of phosphonate and salicylate as compared to the untreated plant or the plant treated with either one alone.

Similarly, Tables B3 and B5 show that a combination of phosphonate and salicylate provide a substantial and unexpected increase in resistance to powdery mildew to sugar beet and grape, respectively. For example, as shown in Table B5, the extent of powdery mildew on grape is substantially and unexpectedly reduced with the combination of phosphonate and salicylate as compared to the untreated plant or the plant treated with either one alone.

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Tables B6 and B7 show that a combination of phosphonate and salicylate provide a substantial and unexpected increase in both yield and resistance to tuber and foliar blight. For example, Table B6 shows that the percent tuber blight is substantially and unexpectedly reduced when the plant is treated with a combination of phosphonate and salicylate as compared to the untreated plant or the plant treated with either one alone. Similarly, Table B6 shows that the yield, quality, and grade of potato is substantially and unexpectedly increased with the combination of phosphonate and salicylate as compared to the untreated plant or the plant treated with either one alone. Table A7 shows that a combination of phosphonate and salicylate provide a substantial and unexpected increase in resistance to foliar blight with the combination of phosphonate and salicylate as compared to the untreated plant or the plant treated with either one alone.

Even if some additive effect might be expected, the effects shown in these Tables would not have been expected and show the synergistic effect of the claimed combination.

Based on the foregoing, Applicants respectfully submit that any possible case of prima facie obviousness of claim 3 and the claims dependent thereon is fully rebutted by the unexpectedly excellent results of this claimed combination.

#### **Combination of Thiosulfate and Salicylate - Claim 5**

Tables C1 and C5 show that a combination of thiosulphate and salicylate (claim 5) provide to grape and oilseed rape, respectively, a substantial and unexpected resistance to powdery mildew, when compared to the untreated plant and to the plants treated with only one of phosphonate or salicylate. For example, as shown in Table C1, the resistance to powdery mildew is substantially and unexpectedly increased with the combination of thiosulphate and salicylate as compared to the untreated plant or the plant treated with either one alone.

Tables C2-C4, C6 and C7 show that a combination of thiosulphate and salicylate provide substantial and unexpected fertilizer effects. Table C2 shows such effects for broad bean, Table C3 shows such effects for peas, Table C4 shows such effects for carrot,

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Table C6 shows such effects for sugar beet and Table C7 shows such effects for strawberry.

Even if some additive effect might be expected, the effects shown in these Tables would not have been expected and show the synergistic effect of the claimed combination.

Based on the foregoing, Applicants respectfully submit that any possible case of prima facie obviousness of claim 5 and the claims dependent thereon is fully rebutted by the unexpectedly excellent results of this claimed combination.

**Combination of Phosphonate, Thiosulphate and Salicylate (Claim 2) and Additional Two-Component Combinations**

As shown in Tables D1-D5, the combination of all three of phosphonate, thiosulphate and salicylate provides a similarly substantial and unexpected increase in resistance to blight, final yield and quality of potato (Table D1 and D2), substantial and unexpected increase in resistance to powdery mildew and fertilizer effects to spring barley (Tables D3 and D4) and substantial and unexpected increase in yield and quality to lettuce (Table D5).

For example, Table D1 shows that without treatment 6% of the potatoes are affected by tuber blight, while with treatment of any one alone of phosphonate, thiosulphate or salicylate, from 2.7 to 3.3% of the potatoes are affected by tuber blight. In contrast, when a combination of any two (claims 1, 3, 5) or all three (claim 2) of phosphonate, thiosulphate and salicylate are applied, only 0.7% of the potatoes are affected by tuber blight. These results clearly show that there is a substantial and unexpected benefit obtained from the claimed combinations.

Similar results are shown in Tables D2-D5. For the sake of brevity, review thereof is omitted. The Examiner is requested to note that in all of the Tables, substantial and unexpected results are obtained by use of the claimed combinations.

Even if some additive effect might be expected, the effects shown in these Tables would not have been expected and show the synergistic effect of the claimed combination.



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Based on the foregoing, Applicants respectfully submit that any possible case of prima facie obviousness of claim 5 and the claims dependent thereon is fully rebutted by the unexpectedly excellent results of this claimed combination.

In *In re Soni*, 34 USPQ2d 1894, 1688 (Fed. Cir. 1995), the court stated:

In our view, however, when an applicant demonstrates substantially improved results, as *Soni* did here, and states that the results were unexpected, this should suffice to establish unexpected results in the absence of evidence to the contrary.

Applicants are not aware of any evidence to the contrary with respect to the results set forth in the Examples in Applicants' specification. In *Soni*, the court reiterated the well-established rule that "all evidence of nonobviousness must be considered when assessing patentability," and further that "the PTO must consider comparative data in the specification in determining whether the claimed invention provides unexpected results." *Id.* at 1187.

Applicants respectfully submit that the Examiner did not fully consider Applicants' evidence of unexpected results set forth in the Examples in the specification. The Examiner must fully consider Applicants' unexpected results. Rather than permit an examiner to ignore or dismiss without full consideration evidence of unexpected results, *In re Soni* makes clear that such evidence must be considered in evaluating the obviousness of a claimed invention. In arriving at the conclusion the claimed invention would have been obvious, the examiner should have given appropriate weight to the evidence of unexpected results. See, *Richardson-Vicks Inc. v. The Upjohn Co.*, 44 USPQ2d 1181 (Fed. Cir. 1997)

Based on the evidence contained in the application as filed, Applicants respectfully submit that, even if the Examiner had stated a prima facie case of obviousness, the substantial and unexpected results shown in the examples of the application fully rebut any such case, and show that the invention would not have been obvious over the prior art. The Examiner is respectfully requested to reconsider and withdraw the rejections of Applicants' claims.

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For the foregoing reasons, Applicant respectfully submits that the claims of the present application patentably distinguish over the prior art, and that the application therefore is in condition for allowance. Applicant respectfully requests notice to such effect.

**The Commissioner is hereby authorized to charge the additional fee for one additional dependent claim to Deposit Account #18-0988, Docket No. DYOUP0219US.**

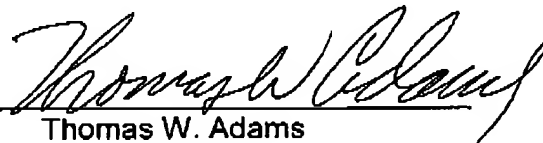
In the event issues remain in the prosecution of this application, Applicant requests that the Examiner telephone the undersigned attorney to expedite allowance of the application. Should a Petition for Extension of Time be necessary for the present Reply to the outstanding Office action to be timely filed (or if such a petition has been made and an additional extension is necessary) petition therefor is hereby made and, if any additional fees are required for the filing of this paper, the Commissioner is authorized to charge those fees to Deposit Account #18-0988, Docket No. DYOUP0219US.

Respectfully submitted,

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Date: February 3, 2004

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